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U. S. Army Aviation Epidemiology Data Register: Gender-Specific Attrition Among the U. S. Army Student Aviator Class of 1987

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Graduated aviators from the U.S. Army student aviator cohort of the Class of 1987 were followed in the Aviation Epidemiology Data Register for 6 years to determine if there was a gender-specific difference in attrition from aviation service. Overall, 30 percent attrition was found in 6 years of observation following initial aviator training. There was no significant gender-specific difference in attrition ($p>0.05$, life table analysis).

Pregnancy was the most common identified cause of female aviator attrition. However, there was no significant increased risk for attrition among all pregnant aviators after delivery (relative risk=0.545, $CI_{0.95}$=0.144,2.06).

Among male aviators, flying evaluation boards with nonmedical termination of aviation service, death due to aircraft mishaps, and alcohol abuse were common identified causes of attrition. These three conditions accounted for 47 percent of known causes for male aviator attrition.

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Female aviators were more likely to be commissioned officers (relative risk=1.778, $CI_{0.95}$=1.453, 2.177). Female aviators were younger than male aviators ((p<0.01, Kolmogorov-Smirnov statistic).

Female aviators were more likely to be granted an exception to policy to enter flight training despite a medical disqualification (relative risk=12.05, $CI_{0.95}$=4.78,30.4). Females were given exceptions to policy for failure to meet anthropometric standards, while males were given exceptions to policy primarily for refractive error and hearing loss in excess of flight training medical standards.

By using only a medical database, such as the AEDR, the cause of attrition could not be determined in many cases. We need to use other databases, and possibly interviews, to improve our knowledge on causes of nonmedical attrition in this cohort.

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Background

Military relevance

The Army has been recruiting female aviators since 1973 (Ludowese, 1992), most in the last decade. By 1994, less than 1.0 percent of U.S. Army female aviators were older than 40, and thus potentially reaching military retirement age (Mason and Shannon, 1994). Therefore, the number of female aviators should be increasing as they accumulate to a steady state of recruitment and retirement. However, the number of U.S. Army female aviators began decreasing in 1989 (Shannon and Mason, 1995).

To analyze this observation, the authors of this study previously selected a cohort of trained U.S. Army aviators in 1988 and followed them into early 1994 (Shannon, Mason, and Harper, 1994). The study showed that U.S. Army female aviators in the cohort of 1988 were significantly younger than male aviators (Mantel-Haenszel χ^2, $p<0.001$). Based on male attrition, and controlling for age differences, the study showed there was a 9.1 percent excess attrition among female aviators. The risk for attrition was greatest in the female age groups 18 to 44 years old ($OR_{(Mantel\text{-}Haenszel)}=1.23$, $CI_{0.95}=1.025,1.470$). The reasons for the excess attrition were unknown.

In contrast, the U.S. Navy studied attrition among U.S. Navy female aviators (Hutton, 1990). The retention rate for females was greater than for males, 53 percent versus 38 percent. The method on how these rates were derived was not described. Analysis of confounders, such as age, was not done.

Since we could find no other articles addressing attrition of female aviators from aviation service, we continue our efforts to find out if the male and female attrition rates from U.S. Army aviator duties are significantly different. This study uses the U.S. Army Aviation Epidemiology Data Register (AEDR) to follow a cohort of U.S. Army student aviators who began flight training in 1987. They are followed until 1994. An estimate of gender-specific attrition was developed by finding out who left aviation service by failure to maintain medical certification for Army flying.

U.S. Army Aviation Epidemiology Data Register

Data were obtained from the U.S. Army Aviation Epidemiology Data Register. The AEDR is a family of databases storing medical history and physical parameters of U.S. Army student and trained aviators. One component is a flying duty medical examination (FDME) database. All U.S. Army flight training applicants and trained aviators are required to submit a FDME upon application, and then annually within 90 days of the end of their next birth month (Department of the Army, 1989). Another component is the waiver and suspension file (WSF), a mortality and morbidity index of flight physical disqualifications, casualty reports, and aeromedical board outcomes. The WSF references a medical document archive, containing the details of WSF cases.

Methods

Fort Rucker was the only training base for U.S. Army student aviators during the study period. Students arrived at Fort Rucker in groups for training. They underwent a repeat entrance flight physical at the U.S. Army Aeromedical Center in flight school groups, usually during the first week of training.

The study cohort for this attrition study, called "the Class of 1987," was formed by applying two criteria. First, the student aviators had their Fort Rucker Class 1 (Warrant officer) or Class 1A (Commissioned officer) flight physical in the calendar year of 1987. Second, the student aviators needed at least one Class 2 (graduate aviator) after their first Fort Rucker FDME, indicating they graduated from the Initial Entry Rotary-wing training course. Thus, they were designated as "in aviation service" and were wearing the U.S. Army aviator skill badge (Department of the Army, 1994).

The Class of 1987 was followed from 1987 through the summer of 1994, looking for attrition in the calendar years 1988 through 1992. A database was extracted and compiled from the AEDR flight physical database and the waiver and suspense file. The database elements were: the aviator's name and Social Security number, gender, age at first and last FDME, medical class of aviation service on the entry and last FDME, date of the first and last FDME, calendar year of the presumed attrition, years of aviation service up to attrition, status of any medical or nonmedical disqualifications, and the reason for the medical and nonmedical disqualification.

Attrition was defined to exist when aviators no longer completed their required annual FDME, were medically and nonmedically terminated from aviation service, or died. For example, an aviator had an entry Fort Rucker student aviator FDME in 1987, and trained aviator FDMEs in 1988, 1989, and 1990; but no FDMEs after 1990. The aviator was lost to followup in 1990, and thus, had 3 years of aviation service as defined by this study.

Calendar year 1993 was the last full year of the study. Aviators, who had a FDME in calendar year 1993, were presumed to be retained in the cohort for a total of 6 years of aviation service. The cohort was observed through the summer of 1994 to gather any late arriving FDMEs with a FDME date in calendar year 1993.

Results

Table 1 tabulates gender by source of commissioning. Class 1A are Commissioned officers from the Reserve Officer Training Corps (ROTC) and the United States Military Academy (West Point). Class 1 are Warrant officers from civilian recruitment and the enlisted ranks of the Army. In the cohort, 3.7 percent were female. Female aviators were more likely to be Class 1A than male aviators (Relative $risk_{(Katz)}$=1.778, $CI_{0.95}$=1.453, 2.177; Kahn and Sempos, 1989).

Table 1.
Gender versus commissioning source among Army student aviators.

	Class 1A Commissioned officer	Class 1 Warrant officer	N	Percent of N
Female	34	16	50	3.7
Male	499	806	1305	96.3
N	533	822	1355	

Figure 1 shows the cumulative frequency distribution of the ages for U.S. Army female and male aviators in the Class of 1987. Female aviators were significantly younger than male aviators ($p<0.01$, Kolmogorov-Smirnov statistic, 2-sided; Daniel, 1983).

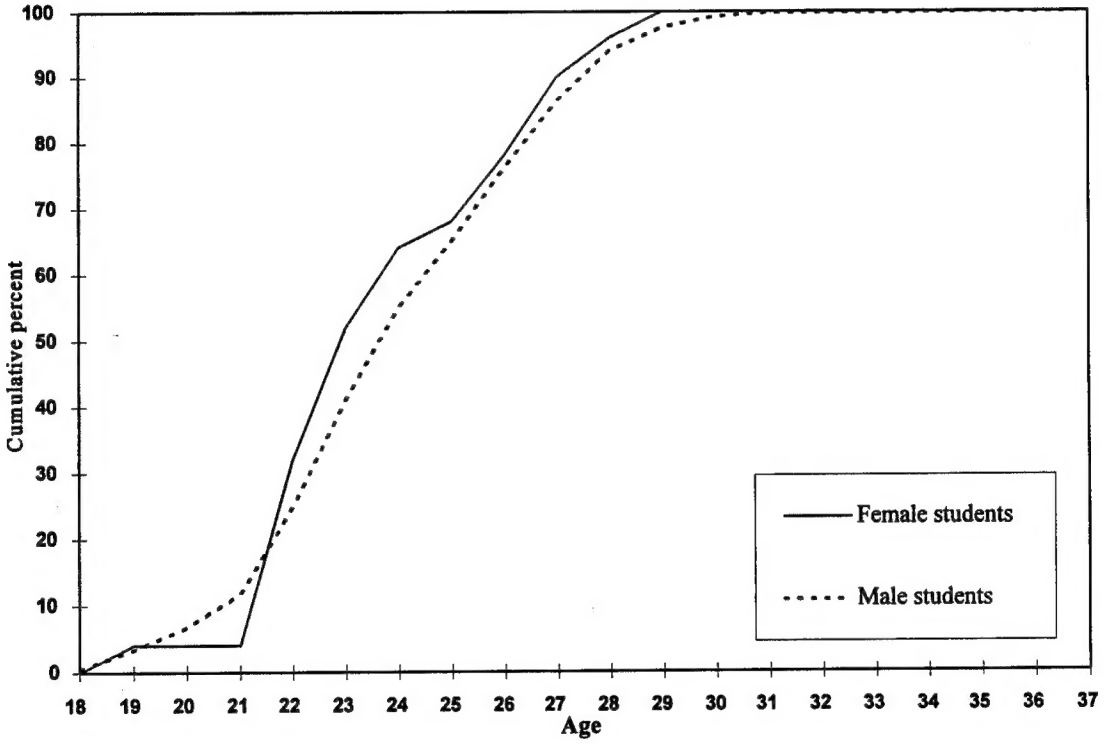

Figure 1. Gender-specific age distribution of Army student aviators in the Class of 1987.

Table 2 shows attrition for U.S. Army female and male aviators in the Class of 1987. There was no significant gender-specific difference in attrition ($p>0.05$, life table analysis, Kahn and Sempos, 1989).

Table 2.
Gender-specific attrition among U.S. Army student aviators.

Gender	Years of aviation service	Number remaining under observation	Number leaving in the year of service	Percent remaining
Female	1	50	1	98.0
	2	49	1	96.0
	3	48	2	92.0
	4	46	4	84.0
	5	42	7	70.0
	6	35		
Male	1	1305	27	97.9
	2	1278	29	95.7
	3	1249	60	91.1
	4	1189	98	83.6
	5	1091	164	71.0
	6	927		

A review of AEDR records showed the cause of attrition in 3 of 15 female aviators and 36 of 378 male aviators. Table 3 shows the identified medical and nonmedical causes for attrition by gender.

Pregnancy without return to flying duties after delivery accounted for 2 of the 3 female aviator attritions. Another 9 female aviators had a total of 10 pregnancies, but returned to flying duties after delivery. Becoming pregnant was not associated significantly with an increased risk for female aviator attrition (Relative $risk_{(Katz)}=0.545$, $CI_{0.95}=0.144,2.06$; Kahn and Sempos, 1989)

In contrast, male aviators in the Class of 1987 were prone to flying evaluation boards resulting in nonmedical termination of aviation service; death due to aircraft mishaps, and alcohol abuse. Some male attrition cases were due to concealed disqualifying medical conditions that existed before acceptance to flight school. These concealed conditions included a history of attention deficit disorder with learning disability, migraine disorder, alcohol abuse, and seizure disorder.

Table 3.
Causes of medical and nonmedical attrition by gender.

Gender	Cause of attrition	N
Female	Pregnancy without return to flying after delivery	2
	Post concussion syndrome	1
Male	Flying evaluation board with nonmedical termination of aviation service	7
	Death due to noncombat aircraft mishap	6
	Alcohol abuse	4
	Migraine disorder	2
	Post concussion syndrome	2
	Herniated nucleus pulposus	2
	Seizure disorder	2
	History attention deficit disorder with current learning disability	1
	Diabetes mellitus	1
	Pedophilia with depression	1
	Human immunodeficiency virus infection	1
	Chronic lumbago	1
	Neurotic disorder	1
	Melanoma	1
	Sarcoidosis	1
	Regional enteritis	1
	Recurrent ventricular tachycardia	1
	Unsatisfactory adaptability and suitability for aviation service (ARMA)	1

Female aviators were twice as likely as male aviators to have waivers for disqualifying medical conditions that were identified after aviator training was completed. However, this finding had borderline significance only (Relative $risk_{(Katz)}$=2.0, $CI_{0.95}$=1.084,3.72; Kahn and Sempos, 1989).

Exceptions to policy are special waivers granted to student aviators who are medically disqualified during the flight school application process or after arrival at Fort Rucker for flight training. Female aviators in the Class of 1987 were significantly more likely to have an exception to policy to enter flight training (Relative $risk_{(Katz)}$=12.05, $CI_{0.95}$=4.78,30.4; Kahn and Sempos, 1989). Table 4 shows the causes for exceptions to policy by gender.

Table 4.
Causes of exception to policy by gender.

Gender	Cause of exception to policy	N with exception	N in cohort	Percent with exception
Female	Failure to meet anthropometric standards	6	50	12.0
Male	Refractive error	7	1305	1.0
	Hearing loss	3		
	History of skull fracture	1		
	Color vision deficiency	1		
	Beta thalassemia minor	1		

Discussion

To recoup the high cost of flight training, aviators have a 6-year military service obligation following flight training. Therefore, we would assume that most would remain in aviation service during the 6 years of observation in this study. There might be some involuntary cases of attrition, such as that due to courts-martial, flying evaluation boards, permanent medical disqualifications, and death. It is possible for aviators to apply for resignation due to a variety of personal causes, such as family crisis. But, despite the service obligation, a surprising 30 percent of aviators in the Class of 1987 were lost to followup. Unfortunately, the cause of attrition could not be identified in most cases. We will need to use other records or databases outside the AEDR to find other nonmedical causes for attrition, such as Army personnel, mishap, and medical disability databases.

We would like to continue following this cohort. One complication in following this cohort in the future is the significant military force reduction that began in 1989. The reductions have been accelerating in the last 2 years, and will continue until the late 1990s. Many in this cohort will be passed over for promotion and separated from military service. Some will elect to leave the service upon completion of obligations, perceiving reduced opportunities for promotion and career service. Force reductions may have affected many in the cohort to date. For example, after Desert Storm operations in 1991, certain aviators with service obligations were offered voluntary separations from the active Army to reduce the force. Some may have been in the cohort of this study.

Summary and conclusions

Graduated aviators from the U.S. Army aviator training Class of 1987 were followed for 6 years to determine if there was a gender-specific difference in attrition from aviation service. Overall, 30 percent attrition was found in 6 years of observation following initial aviator training. There was no significant gender-specific difference in attrition ($p>0.05$, life table analysis).

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References

Daniel, W. W. 1983. Biostatistics: a foundation for analysis in the health sciences, 3rd edition. New York: John Wiley and Sons.

Department of the Army. 1989. Medical fitness standards. Washington, DC: Department of the Army. Army Regulation 40-501.

Department of the Army. 1994. Aviation service. Washington, DC: Department of the Army. Army Regulation 600-105.

Hutton, L. V. 1990. The integration of women into U. S. Navy aircrew training and squadron assignments. Recruiting, selection, training, and military operations of female aircrew. AGARD Conference Proceedings No. 491; 1-1 to 1-5.

Kahn, H. A., and Sempos, C. T. 1989. Statistical methods in epidemiology. New York, NY: Oxford University Press.

Ludowese, J. C. 1992. Women in Army aviation: Changing paradigms. U. S. Army aviation digest. November/December, pages 45-48.

Mason, K. T., and Shannon, S. G. 1994. U.S. Army Aviation Epidemiology Data Register: Age distribution of U.S. Army aviators stratified by gender and component of service. Fort Rucker, AL: U.S. Army Aeromedical Research Laboratory. USAARL Technical Report No. 94-4.

Shannon, S. G. , Mason, K. T., and Harper, J. P. 1994. U.S. Army Aviation Epidemiology Data Register: Gender-specific attrition from the trained U.S. Army aviator cohort of 1988. Fort Rucker, AL: U.S. Army Aeromedical Research Laboratory. USAARL Technical Report No. 94-36.

Shannon, S. G., and Mason, K. T. 1995. U.S. Army Aviation Epidemiology Data Register: Trends in the age distribution of Army aviators stratified by gender and component, 1986 to 1992. Fort Rucker, AL: U.S. Army Aeromedical Research Laboratory. USAARL Technical Report No. 95-2.

Other references not cited

Brooks, C. J. 1992. A brief introduction to the history of women in aviation. Recruiting, selection, training, and military operations of female aircrew. AGARD Conference Proceedings No. 491; pages I-1 to I-3.

Mason, K. T. 1994. Pregnancy and flying duties. Fort Rucker, AL: U.S. Army Aeromedical Research Laboratory. USAARL Technical Report No. 94-44.

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